Original Research Paper

Volume - 15 | Issue - 06 | June - 2025 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Anaesthesiology

NAVIGATING ANAESTHETIC CHALLENGES IN ANKYLOSING SPONDYLITIS: LESSONS FROM A KYPHOSCOLIOSIS SURGERY CASE

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ABSTRACT Patients diagnosed with ankylosing spondylitis (AS) pose substantial challenges in the context of airway management, they frequently exhibit complex and severe intubation difficulties, which stem from a combination of factors, including the loss or complete absence of cervical spine mobility, a fixed flexion deformity affecting the thoracolumbar region, and the potential involvement of the temporomandibular joint. In the advanced stages of AS, the progressive inflammation and subsequent spinal fusion commonly referred to as the "bamboo spine"often result in pronounced thoracic kyphosis. While scoliosis is less prevalent in AS compared to kyphosis, it may arise due to asymmetric inflammation impacting the spinal or costovertebral joints. In some instances, a combined deformity of kyphoscoliosis may occur.

KEYWORDS : Ankylosing Spondylitis (AS) ,Kyphoscoliosis

INTRODUCTION

Ankylosing spondylitis (AS) alternatively known as Morbus Bechterew is a chronic, inflammatory disease primarily affecting the axial spine that can manifest with a range of clinical signs and symptoms. The hallmark features of the condition include chronic back pain and progressive spinal stiffness.

The cause of ankylosing spondylitis (AS) remains largely unknown. However, there appears to be a correlation between the prevalence of AS and the presence of human leukocyte antigen (HLA)-B27 in a given population. Among individuals who are HLA-B27 positive, the prevalence of AS is approximately 5% to 6%.[1]

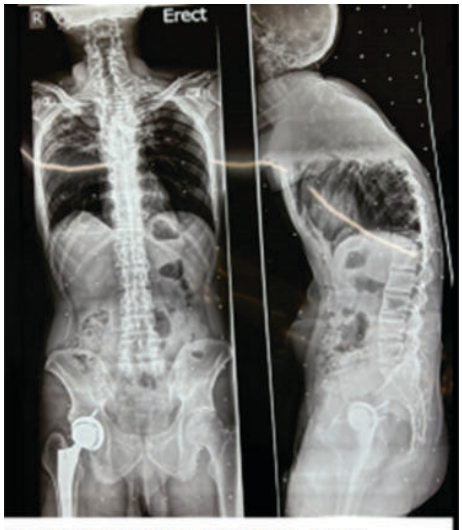
The disease usually originates in the pelvic joints before expanding to the spine and affecting the spinal column region's joints, intervertebral discs and ligaments. In advanced stages, it can spread to other joints, including the hip and shoulder, and eventually lead to ossification of all connective structures and ankylosis of the joints, resulting in immobility of the spinal column that adopts a “bamboo” appearance [2,3]

When AS involves the cervical spine, it may cause difficult airways, especially when temporomandibular is involved. This poses a major challenge to the airway management of the anesthesiologist[3]

Case Report

A 34-year-old male patient (height 175cm, weight 75kg, ASA III, Mallampati II.), with mild TR, underwent thoracolumbar kyphotis correction orthopedic surgery. Physical examination revealed a deformity of the spine, with the spine tilted forward and fixed (, posterior extension and lateral bending limitation, Biochemical examination showed WBC 6.5× 109/L, alanine aminotransferase 36IU/L, aspartate aminotransferase 22U/L and HLA-B27 positive, and thoracic MRI showed thoracic and lumbar kyphosis changes, and the upper and lower margins of the vertebral bodies were straight, which conformed to the changes of ankylosing spondylitis. His mouth opening was 30 mm and thyromental distance was 55 mm. The cervical spine was solidified with maximum flexion and extension of 25°, and an oropharyngeal axis angle of 70°.

The patient's ECG, SpO2, blood pressure, and end-tidal CO2 were routinely monitored. 0.2mg glycopyrrolate was administrated to reduce airway secretions. We administered fentanyl 40 µg for conscious sedation with preserved spontaneous breathing and then propofol 3mg/kg and scoline 1.5mg/kg given. Patients with AS usually can't lie down, so we intubated in a supine position with two pillows under the shoulder. Neither the VL nor the introduction tool effectively revealed the epiglottis due to constrained neck movement. As a result, the endotracheal tube could not be inserted successfully. With the aid of Cmac VLs, we guided the endotracheal intubation using a bougie . The oropharynx was opened sufficiently so that the tracheal tube could be rapidly introduced below the epiglottis and entered the glottis. After intubation, connect the anesthesia threaded tube to listen to the breathing sounds of both lungs and give deep anesthesia and muscle relaxants symmetrically. Induction dose of relaxant atracurium 0.5mg/kg given and N2O+4% desflurane inhalation were used to maintain anesthesia. USG guided right IJV secured using long axis view. Right radial arterial line alse secured for IBP monitoring .Entropy monitoring done to maintaine adequate depth of anaestheisa and nasal temperature probe connected .The operation lasted for 8hrs and throghout the procedure neuromonitoring was done using SSEP and MEP. During this period anaeathsia maintained on propofol+ dexmeditomidine infusion +desflurane inhalational.2000ml blood loss happened so managed with crystalloids,2PRC +2FFP transfused .After the operation, the patient was fully awake and had enough ventilation, swallowing, and cough reflexes recovered. Use a tube exchanger for extubation after sufficient sputum suction. The patient recovered well without postoperative complications



X RAY SPINE ERECT AND LATERAL VIEW

FIGURE SHOWING INTRA OP PRONE POSITION WITH ADEQUATE PADDING OF PRESSURE POINTS

DISCUSSION

Patients with AS may present tremendous challenges to the anesthesiologists due to fusion of the cervical and thoracal spine, and stiffness of the temporomandibular joint[5].Reduced cervical and thoracolumbar spine mobility, and temporomandibular joint disease are common in the patients with long lasting AS.[7-9]

About 50% of patients with AS have cervical spine radiological involvement after 15 years, and 70% after 20 years.[10] Temporo-mandibular joint involvement occurs in 10% of patients, whereas it may increase up to 30-40% when the disease is long standing.[11]

The other likely problem in patients with AS during intubation is that AS patients are susceptible to vertebral fractures even from minor trauma, because of the rigid/deformed vertebra and accompanying osteoporosis[12].

Hence, During airway management in patients with Ankylosing Spondylitis, following points needs to be given consideration (1) involvement of cervical spine and TM joint(2) vulnerability of fracture at cervical spine during manipulations and (3) subsequent risk of neurological injury . Hence, the type of laryngoscope employed for airway management in these patients should be (1) slim enough to be introduced through restricted oral aperture and (2) provide a glottic view with no/minimum cervical manipulation and without any application of excessive force.[13]

Awake fiberoptic bronchoscopy is supposed to be a safest technique for suspected or diagnosed difficult airway patients, but it is technically demanding. Recently, use of modern digital airway equipments like Glidescope 9, Bullard laryngoscope 10, Pentax airway scope 11, LMA Fastrach (ILM) 12 have been reported for laryngoscopy in Ankylosing Spondylitis patients with variable success rate. Truview EVO2, one of the newer types of optical laryngoscope, has been successfully used in cases with restricted cervical spine movementand other difficult airway scenario.[13]

The C-MAC (Karl Storz, Tuttlingen, Germany) incorporates a standard Macintosh blade with a camera placed at its tip and a video display unit .[14]Therefore, the C-MAC can be used both as a standard direct laryngoscope and as an indirect laryngoscope. Many previous studies showed that a limited laryngeal view with direct laryngoscopy was improved with C-MAC. (15-17)Recently, the producers of the C-MAC have produced C-MAC D-Blade, which has a highly angulated video laryngoscopic blade. The D-Blade is half-moon-shaped and can be used with the C-MAC system. This equipment was added to the C-MAC system to increase the potential to manage difficult airways and to introduce an alternative blade that can be used in extremely difficult conditions [18].Although the C MAC D-Blade has been shown in recent trials to be beneficial in difficult airway conditions[19],present knowledge about the use of the D-Blade in different difficult laryngoscopy conditions is limited.

CONCLUSION

Ankylosing spondylitis presents significant challenges for airway management due to spinal rigidity, deformities, and temporo-mandibular joint involvement. This case highlights the importance of meticulous preoperative evaluation, appropriate selection of airway devices, and the use of advanced video laryngoscopes like the C-MAC for successful intubation in patients with restricted cervical mobility. With careful planning and tailored anesthetic strategies, even complex airway scenarios in AS patients can be managed safely and effectively.

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